optical signals corresponding to a respective subwindow within the operating window, each subwindow corresponding to a different subgroup of channels within the operating window;

coarse wavelength division demultiplexing the first set of subgroups of optical signals into a group of optical signals within the operating window; and

amplifying optical signals corresponding to each subwindow using a different optical line amplifier for each subwindow.

42. The method of claim 41, further comprising:

coarse wavelength division multiplexing the optical signals into a second set of subgroups of optical signals, each subgroup of optical signals corresponding to a respective subwindow within the operating window, each subwindow corresponding to a different subgroup of channels within the operating window; and

fine wavelength division multiplexing the optical signals within a respective subgroup of optical signals of the second set of subgroups of optical signals into individual channels within a corresponding subwindow.

43. The method of claim 42, wherein coarse wavelength division multiplexing the optical signals further comprises:

multiplexing the optical signals into first and second subgroups of optical signals depending upon wavelength in corresponding first and second subwindows within the operating window, wherein the first subwindow comprises a first group of channels and the second subwindow comprises a second group of channels.

~~44. The method of claim 43, wherein the first group of channels comprises channels in a~~ range of wavelengths between approximately 1530 to 1536 nm.

45. The method of claim 44, wherein the second group of channels comprises channels in a range of wavelengths between approximately 1547 to 1553 nm.

46. The method of claim 43, wherein fine wavelength division demultiplexing the optical signals further comprises:

demultiplexing the optical signals into third and fourth subgroups of optical signals depending upon wavelength in corresponding third and fourth subwindows within the operating window, wherein the third subwindow comprises a third group of channels and the fourth subwindow comprises a fourth group of channels.

47. The method of claim 46, wherein the third group of channels comprises channels in a range of wavelengths between approximately 1538 to 1543 nm.

48. The method of claim 47, wherein the fourth group of channels comprises channels in a range of wavelengths between approximately 1555 to 1561 nm.

49. A system for multiplexing/demultiplexing optical signals in a set of multiple channels within an operating window of a fiber communication network, comprising:

~~a plurality of fine wavelength division demultiplexing/multiplexing units, a first number~~ of the plurality of fine wavelength division demultiplexing/multiplexing units configured to demultiplex the optical signals from individual channels of the set of multiple channels into a first set of subgroups of optical signals, each subgroup of optical signals corresponding to a respective subwindow within the operating window, each subwindow corresponding to a different subgroup of channels within the operating window;

a coarse wavelength division demultiplexing/multiplexing unit configured to demultiplex the first set of subgroups of optical signals into a group of optical signals within the operating window; and

a plurality of optical line amplifiers, each amplifier configured to amplify optical signals corresponding to a different subwindow within the operating window.

50. The system of claim 49, the coarse wavelength division demultiplexing/multiplexing unit further configured to:

multiplex the optical signals into a second set of subgroups of optical signals, each subgroup of optical signals corresponding to a respective subwindow within the operating window, each subwindow corresponding to a different subgroup of channels within the operating window; and

at least a second number of the plurality of fine wavelength division demultiplexing/multiplexing units configured to:

multiplex the optical signals within a respective subgroup of optical signals of the second set of subgroups of optical signals into individual channels within a corresponding subwindow.

51. The system of claim 50, the coarse wavelength division multiplexing/demultiplexing unit further configured to:

multiplex the optical signals into first and second subgroups of optical signals depending upon wavelength in corresponding first and second subwindows within the operating window, wherein the first subwindow comprises a first group of channels and the second subwindow comprises a second group of channels.

52. The system of claim 51, wherein the first group of channels comprises channels within a range of wavelengths of 1530 to 1536 nm.

53. The system of claim 52, wherein the second group of channels comprises channels in a second range of wavelengths between approximately 1547 to 1553 nm.

54. The system of claim 51, the first number of the plurality of fine wavelength division demultiplexing/multiplexing units further configured to:

demultiplex the optical signals into third and fourth subgroups of optical signals depending upon wavelength in corresponding third and fourth subwindows within the

operating window, wherein the third subwindow comprises a third group of channels and the fourth subwindow comprises a fourth group of channels.

55. The system of claim 54, wherein the third group of channels comprises channels within a range of wavelengths of approximately 1538 to 1543 nm.

56. The system of claim 55, wherein the fourth group of channels comprises channels within a range of wavelengths of approximately 1555 to 1561 nm.

57. A method of equalizing optical gain across a set of channels within an operating window of a fiber communication network, comprising:

fine wavelength division demultiplexing the optical signals from individual channels of the set of multiple channels into a first set of subgroups of optical signals, each subgroup of optical signals corresponding to a respective subwindow within the operating window, each subwindow corresponding to a different subgroup of channels within the operating window;

coarse wavelength division demultiplexing the first set of subgroups of optical signals into a group of optical signals within the operating window; and

amplifying optical signals corresponding to each subwindow using a different optical line amplifier for each subwindow, wherein the optical signals are amplified to substantially equalize gain across all the channels of the set of channels within the operating window.

58. The method of claim 57, further comprising:

coarse wavelength division multiplexing the optical signals into a second set of subgroups of optical signals, each subgroup of optical signals corresponding to a respective subwindow within the operating window, each subwindow corresponding to a different subgroup of channels within the operating window; and

fine wavelength division multiplexing the optical signals within a respective subgroup of optical signals of the second set of subgroups of optical signals into individual channels within a corresponding subwindow.

59. The method of claim 58, wherein coarse wavelength division multiplexing the optical signals further comprises:

multiplexing the optical signals into first and second subgroups of optical signals depending upon wavelength in corresponding first and second subwindows within the operating window, wherein the first subwindow comprises a first group of channels and the second subwindow comprises a second group of channels.

60. The method of claim 59, wherein the first group of channels comprises channels within a range of wavelengths of 1530 to 1536 nm.

61. The method of claim 60, wherein the second group of channels comprises channels in a second range of wavelengths between approximately 1547 to 1553 nm.

62. The method of claim 59, wherein fine wavelength division demultiplexing

~~the optical signals further comprises:~~

demultiplexing the optical signals into third and ~~fourth subgroups of optical signals~~ depending upon wavelength in corresponding third and fourth subwindows within the operating window, wherein the third subwindow comprises a third group of channels and the fourth subwindow comprises a fourth group of channels.

63. The method of claim 62, wherein the third group of channels comprises channels within a range of wavelengths of approximately 1538 to 1543 nm.

64. The method of claim 63, wherein the fourth group of channels comprises channels within a range of wavelengths of approximately 1555 to 1561 nm.

65. A system for equalizing optical ~~gain aeross~~ a set of channels within an operating window of a fiber communication network, comprising:

a plurality of fine wavelength division demultiplexing/multiplexing units, at least a first number of the plurality of fine wavelength division demultiplexing/multiplexing units configured to demultiplex the optical signals from individual channels of the set of multiple channels into a first set of subgroups of optical signals, each subgroup of optical signals corresponding to a respective subwindow within the operating window, each subwindow ~~corresponding to a different~~ subgroup of channels within ~~the operating window;~~

a coarse wavelength division demultiplexing/multiplexing unit configured to demultiplex the first set of subgroups of optical signals into a group of optical signals within the operating window; and

a plurality of optical line amplifiers configured to amplify optical signals corresponding to each subwindow using a different optical line amplifier for each subwindow, wherein the optical signals are amplified to substantially equalize gain across all the channels of the set of channels within the operating window.

66. The system of claim 65, the coarse wavelength division demultiplexing/multiplexing unit further configured to multiplex the optical signals into a second set of subgroups of optical signals, each subgroup of optical signals corresponding to a respective subwindow within the operating window, each subwindow corresponding to a different subgroup of channels within the operating window;

at least a second number of the fine wavelength division demultiplexing/multiplexing units further configured to multiplex the optical signals within a respective subgroup of optical signals of the second set of subgroups of optical signals into individual channels within a corresponding subwindow.

67. The system of claim 66, the coarse wavelength division multiplexing/demultiplexing unit further configured to:

multiplex the optical signals into first and second subgroups of optical signals depending upon wavelength in corresponding first and second subwindows within the

operating window, wherein the first subwindow comprises a first group of channels and the second subwindow comprises a second group of channels.

68. The system of claim 67, wherein the first group of channels comprises channels within a range of wavelengths of 1530 to 1536 nm.

69. The system of claim 68, wherein the second group of channels comprises channels in a second range of wavelengths between approximately 1547 to 1553 nm.

70. The system of claim 67, the first number of fine wavelength division demultiplexing/multiplexing units further configured to:

demultiplex the optical signals into third and fourth subgroups of optical signals depending upon wavelength in corresponding third and fourth subwindows within the operating window, wherein the third subwindow comprises a third group of channels and the fourth subwindow comprises a fourth group of channels.

71. The system of claim 70, wherein the third group of channels comprises channels within a range of wavelengths of approximately 1538 to 1543 nm.

72. The system of claim 71, wherein the fourth group of channels comprises channels within a range of wavelengths of approximately 1555 to 1561 nm.

~~73. A method of multiplexing/demultiplexing optical signals~~ in a set of multiple channels within an operating window of a fiber communication network, comprising:

coarse wavelength division multiplexing at least a first portion of a group of optical signals into a first set of subgroups of optical signals, each subgroup of optical signals corresponding to a different subwindow within the operating window;

fine wavelength division multiplexing the subgroups of optical signals into individual channels comprising a first subset of the set of multiple channels;

fine wavelength division demultiplexing individual channels comprising a second subset of the set of channels into a second set of subgroups of optical signals, each subgroup of optical signals corresponding to a different subwindow within the operating window; and

coarse wavelength division demultiplexing the second set of subgroups of optical signals into at least a second portion of the group of signals.

74. The method of claim 73, further comprising:

amplifying optical signals corresponding to each subwindow using a different optical amplifier for each subwindow.

75. A system for multiplexing/demultiplexing optical signals in a set of multiple channels within an operating window of a fiber communication network, comprising:

~~a coarse wavelength division multiplexing/demultiplexing unit configured to:~~

~~wavelength division multiplex at least a first portion of a group of optical~~ signals into a first set of subgroups of optical signals, each subgroup of optical signals corresponding to a different subwindow within the operating window; and

a plurality of fine wavelength division multiplexing/demultiplexing units configured to:

wavelength division multiplex the first set of subgroups of optical signals into individual channels comprising a first subset of the set of multiple channels, and

wavelength division demultiplex individual channels comprising a second subset of the set of channels into the second set of subgroups of optical signals, each subgroup of optical signals corresponding to a different subwindow within the operating window,

the coarse wavelength division multiplexing/demultiplexing unit further configured to:

wavelength division demultiplex the second set of subgroups of optical signals into at least a second portion of the group of signals.

76. The system of claim 75, further comprising:

a plurality of optical amplifiers configured to amplify optical signals corresponding to ~~each subwindow using a different optical amplifier for each subwindow.~~

77. A system for multiplexing/demultiplexing optical signals in a set of multiple channels within an operating window of a fiber communication network, comprising:

a coarse wavelength division multiplexing/demultiplexing unit configured to support bi-directional optical signal traffic, the optical signal traffic comprising a first set of subgroups